Avoidance and Minimization

Site availability for this project is limited by surrounding residential and industrial infrastructure, the locations of existing transmission lines, necessary acreage needed to construct the proposed substation, and requirements of the project as approved by the Midcontinent Independent System Operator (MISO). This project is needed to comply with the North American Electric Reliability Council (NERC) reliability requirements. Specifically, the (n-2) contingency loss of various 230 kV transmission lines in the Beaumont/Port Arthur area results in low voltages or transmission circuit overloads and could result in a load shedding (rolling blackout) event. In 2020, the worst (n-2) contingency event is projected to result in an excess of 850 MW of load shedding (blackouts) in the Beaumont/Port Arthur area due to cascading, if the event were to occur during peak loading conditions. MISO, as part of its annual transmission expansion planning (MTEP) 2016 process, determined that additional switching substations (including Garden Substation) and a proposed 230 kV transmission line are necessary before the summer of 2020 to continue to provide adequate and reliable service to customers in the southeastern area of ETI's service territory and comply NERC's reliability standards.

To mitigate the NERC reliability non-compliance, the Garden Substation must be sited in a manner that allows connection to two existing 230kV lines (i.e., Nederland-Mid County, McFadden Bend- China 230kV transmission lines). The only location in which both of these transmission lines pass a single point is the proposed location for the Garden Substation. Furthermore, the applicant submitted an application for a Certificate of Convenience and Necessity (CCN) for the project to the Public Utility Commission of Texas (PUCT) in April 2017. As a regulated public utility, the applicant's infrastructure placements are subject to review by the PUCT. Although the PUCT will review multiple potential transmission right-of-way alignments, the applicant must propose substation sites that demonstrate the project will effectively meet its purpose and need. In this case, the applicant is required to place the substation at this site to mitigate non-compliance with NERC reliability standards that will support the industrial and domestic growth to the west of Nederland and Groves, Texas. In January 2018, the PUCT approved the CCN application for the project, including the recommended site location for the Garden Substation.

To provide functionality, substations must be placed along the existing transmission line corridors. Therefore, the applicant evaluated all properties near the intersection of the existing transmission corridors within two miles of the preferred location. Based on the National Wetlands Inventory (NWI), the only areas near the existing alignment that are not identified as wetlands are privately owned property to the southwest (Diamond M Cattle and Exotics) and industrial and residential properties to the south and west, respectively. However, these sites are not located in close proximity to both transmission lines that must connect to the Garden substation, making these sites financially and practically untenable because these sites would require construction of an additional transmission line to connect to the second line that is not near these alternate sites. The preferred site abuts both transmission lines the substation is

required to serve. Because all other undeveloped tracts in the vicinity of the transmission line are identified as bearing significant wetlands, construction in another location would require acquisition of the property, construction of accompanying transmission lines and access roads, and would likely impact significantly greater acreage of wetland through conversion than the preferred location.

Because of the lack of suitable, confirmed upland sites owned by the applicant, the applicant has proceeded with a design that minimizes wetland impacts to the extent practicable within the parcels they own. The substation layout has been placed in a manner that reduces the impacts while complying with the safety requirements for a substation. The access road will follow an existing road bed to the extent possible and is as short as possible while ensuring safe access. Furthermore, the substation placement has been oriented to reduce loss of wetland functions to the extent possible. Specifically, the proposed location is oriented such that the transmission tie-ins will be as close to the edge of the property as possible, thereby minimizing the amount of vegetation that must be cleared and limits the fragmentation of the remaining wetlands. During preliminary design, the applicant planned to clear the entire property except for a forested fringe to screen the property; however, to reduce wetland impacts, the final plan is to clear only the space necessary for the substation. Finally, the substation site required review and approval by PUCT before permitting could commence. Any attempts to relocate the substation would require an extensive review by PUCT that would delay the load-sharing that the project is intended to provide.

Alternatives Analysis

As a result of the above statements, ETI is providing the following “no-build” and “build” alternatives. Additionally, the provided “build” alternative for the project will avoid and minimize impacts to waters of the United States including wetlands to the greatest extent practicable, as discussed below. As such, this documents the avoidance and minimization.

Alternative 1 – No Build Alternative

Under this alternative, ETI would not construct and operate the proposed substation. This alternative would not provide the needed relief for existing infrastructure and would not add additional load serving capabilities to the Port Arthur network. This alternative would not result in potential impacts to wetlands or waters of the U.S. and would not affect threatened and endangered species habitat or cultural resources. No Individual Permit (IP) application would be submitted, and no coordination with U.S. Fish and Wildlife Service (USFWS) or State Historic Preservation Office (SHPO) would be required.

Alternative 2 – On Site Alternative (The Preferred Alternative)

Under this scenario, ETI would construct the proposed substation and access road to meet the project's purpose and need. Placement of the substation is limited by the location of existing transmission lines, land ownership, easement restrictions, and the requirements of the Port Arthur Reliability Project. The dearth of properties sufficiently sized to accommodate the substation, located adjacent to transmission lines, and in areas that are uplands make avoidance of wetland fill in the project area impracticable. Therefore, much of the infrastructure would be placed inside of the 500-year floodplain. Permanent fill to construct the substation and the associated infrastructure has been positioned to reduce permanent fill of wetlands as much as possible. However, proposed plans include fill of PSS and PEM wetlands as well as conversion of PSS wetlands to PEM wetlands within a 50-foot perimeter of the substation and within a 225-foot ROW for power pole placement. No fill material would be placed within Rhodair Gully. This alternative's direct effects include permanent fill of approximately 6.360 acres of wetlands (5.864 acres of PSS and 0.496 acre of PEM). Approximately 5.799 acres of PSS wetlands will be converted to PEM wetlands. Up to approximately 9.894 acres of PEM may be temporarily impacted by construction activities, but will be restored to preconstruction contours and allowed to re-vegetate after construction is complete. No lasting pollution will occur. This alternative does not have the potential to impact cultural resources or threatened and endangered species. This alternative provides the least environmentally damaging practical alternative due to the following:

• The parcels proposed for the substation and access roads are already owned by ETI and the project will not adversely impact any conservation areas;
• The parcels will not require the construction of extensive transmission lines to reach more remote substation locations; and
• This alternative would meet the criteria for the project's purpose outlined above including, but not necessarily limited to, siting close to the existing ETI owned transmission line, ability to construct necessary infrastructure, and will be developed on property already owned by ETI. This combination of factors is required to render the project economically feasible.

Compensation

After the maximum practicable avoidance and minimization efforts were implemented, it was determined that unavoidable permanent impacts to 6.360 acres wetlands (5.864 acres of PSS and 0.496 acre of PEM), unavoidable conversion of 5.799 acres of PSS to PEM, and up to 9.894 acres of temporarily impacted PEM wetlands as construction equipment traverses the easement. Therefore, ETI proposes to provide compensatory mitigation for losses associated with permanent fill and conversion of wetlands based on the USACE Galveston District Riverine Herbaceous/Shrub interim hydrogeomorphic model (iHGM).

The objective of the iHGM approach is to provide a means of assessing the functional capacity of a given wetland system. Emphasis is placed on the physical (TSSW),

biological (MPAC), and chemical (RSEC) functional characteristics. The USACE Galveston District Riverine Herbaceous/Shrub interim HGM model was used to calculate a functional capacity index (FCI) for each characteristic of the wetland assessment area. FCI values were then multiplied by the respective wetland acreage to calculate functional capacity units (FCU) for each characteristic. FCUs translate to wetland mitigation credits. The FCU values for each function of the model used for the assessment areas are presented in Table 2.

Table 2. FCUs for PSS and PFO wetlands within the proposed project impacted by fill.

			FCU		
WAA	**Type**	**Acreage**	**TSSW**	**MPAC**	**RSEC**
WAA 1	PEM	0.496	0.267	0.264	0.230
WAA 2	PSS	5.864	2.340	2.932	2.856
Total		**6.360**	**2.607**	**3.196**	**3.085**

Conversion compensation was determined by calculating the functional loss associated with all of the PSS wetlands that are to be converted to PEM wetlands. This was done by calculating the pre-project score and the predicted post-project score to establish the change (i.e., delta [Δ]) in functional capacity units (FCUs) associated with the conversion (Table 3).

Table 3. Summary of pre-project, predicted post-project, and delta (Δ) iHGM scores for PSS wetland conversion impacts.

WAA	**Acreage**	**Pre-Project FCU's**			**Post-Project FCU's**			**Conversion Δ**		
		TSSW	**MPAC**	**RSEC**	**TSSW**	**MPAC**	**RSEC**	**TSSW**	**MPAC**	**RSEC**
WAA2	5.799	2.314	2.900	2.824	2.378	3.091	2.105	0.064	0.191	-0.719

The functional assessment determined that the PSS wetland conversion caused by construction of the proposed project will result in a net increase in TSSW and MPAC functions, but a net decrease of 0.719 RSEC functions.

Based on the functional impact calculations ETI assumes the project will require mitigation for the 2.340, 2.932, and 3.548 physical, biological, and chemical functions, respectively, for fill and conversion impacts to PSS wetlands. Similarly, ETI assumes the project will require mitigation for the 0.267, 0.264, and 0.230 physical, biological, and chemical functions, respectively, for fill impacts to PEM wetlands. ETI proposes to offset the impacts through the purchase of wetland mitigation credits from approved mitigation banks. Refer to Attachment E of the Individual Permit application for the Preliminary Mitigation Plan with the Wetland Functional Assessment Report.